

**Screencast:** [16-networking.webm](#) or [16-networking.mp4](#)

## LaUSAH REFERENCE - Chapter 14, TCP/IP Networking RHEL8 Configuring and Managing Networking Guide (PDF)

Please **DO NOT** edit nor attempt to alter the network configuration of your student KVM VM.

### What network card do I have?

`lspci | grep -i net` (lspci is provided by the pciutils package)  
(will work in KVM VM [or physical machine])

Example output:

```
[root@kvm-dowdle ~]# lspci | grep -i net
00:03.0 Ethernet controller: Red Hat, Inc Virtio network device
```

### Network basics

To configure the network on a computer you usually need to know a few pieces of information:

- IP address
- Default gateway
- Network mask
- DNS

If your network uses DHCP (Dynamic Host Configuration Protocol) you can use a dhcp client application and have your computer get all of the needed network settings from the DHCP server.

### Tools to configure the network

- nmcli - <https://www.youtube.com/watch?v=6xfSUDxeasA>
- nmtui - <https://www.youtube.com/watch?v=E7gWVZrZbUY>
- nm gui - <https://www.youtube.com/watch?v=QJd3AJW05Aw> (applets for KDE and GNOME)

Lower Level Tools

ip, ifconfig

### How to set the system hostname

```
hostnamectl set-hostname {host.domain.tld}
hostnamectl set-hostname kvm-dowdle.localdomain
```

### Example configurations

```
[root@csci351 ~]# cat /etc/sysconfig/network-scripts/ifcfg-ens18
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=none
DEFROUTE=yes
IPV4_FAILURE_FATAL=yes
IPV6INIT=yes
IPV6_AUTOCONF=no
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
NAME=ens18
UUID=a28f5b2c-99b4-454c-b3f4-0e3efb89baeb
DEVICE=ens18
ONBOOT=yes
IPADDR=153.90.127.176
PREFIX=24
GATEWAY=153.90.127.254
DNS1=153.90.2.1
DNS2=153.90.2.15
DOMAIN="cs.montana.edu msu.montana.edu coe.montana.edu"
IPV6_PRIVACY=no
```

Please note that **/etc/hosts** is a special file in that it can be used as a sort of "local DNS". /etc/hosts is usually consulted before the specified nameservers and /etc/hosts can be used to override DNS lookups if desired. /etc/hosts sample contents:

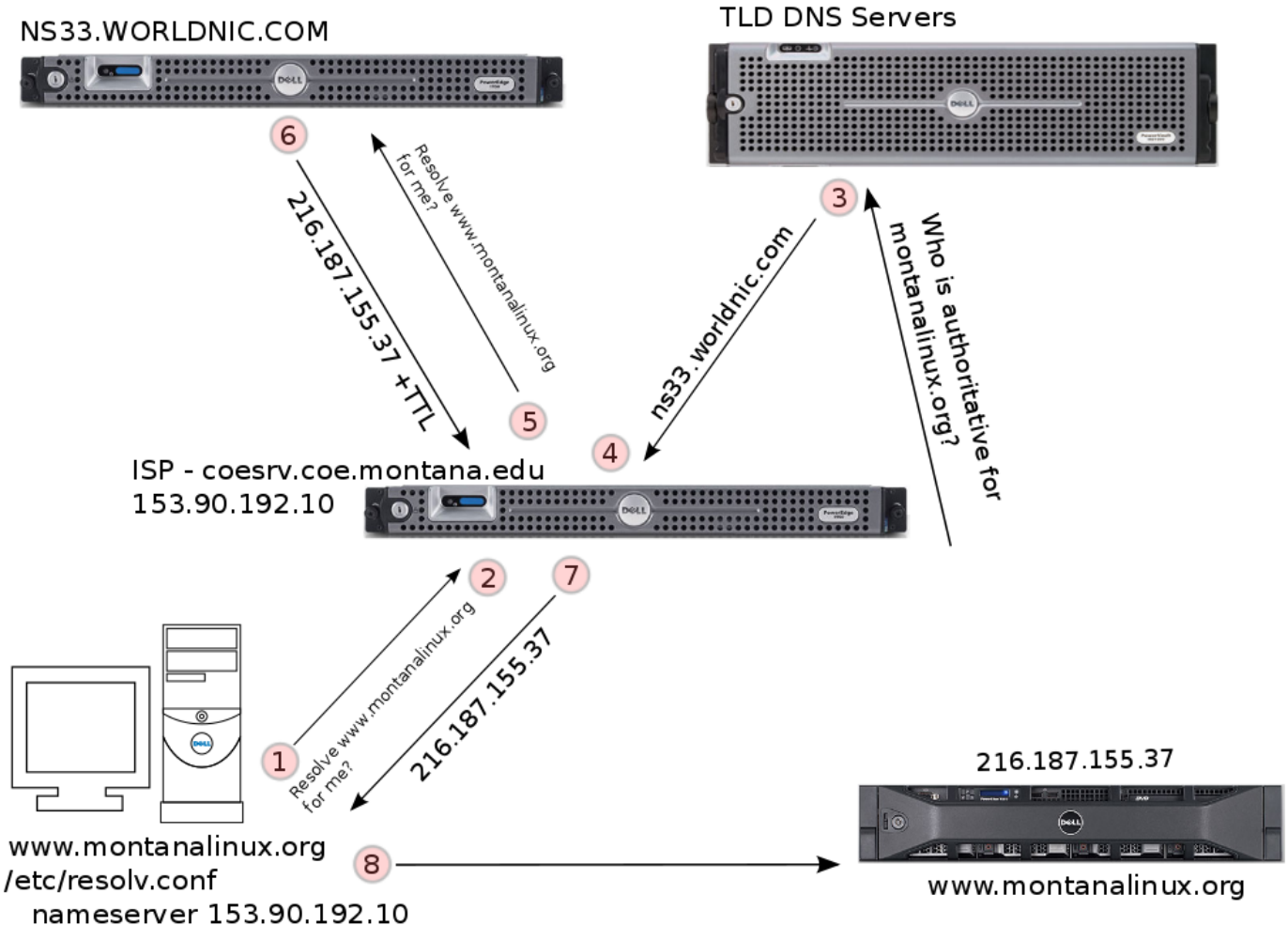
```
[dowdle@csci351 ~]$ cat /etc/hosts
(examine the output... short excerpt below)
192.168.122.101      kvm-101.localdomain    kvm-101      kvm-alghamdi
192.168.122.102      kvm-102.localdomain    kvm-102      kvm-alvarez
192.168.122.103      kvm-103.localdomain    kvm-103      kvm-arstein
```

```
[...]
92.168.122.157      kvm-157.localdomain    kvm-157      kvm-wilkerson
192.168.122.158      kvm-158.localdomain    kvm-158      kvm-wintersteen
192.168.122.159      kvm-159.localdomain    kvm-159      kvm-zetterberg
```

DNS configuration is stored in **/etc/resolv.conf**. Here is an example /etc/resolv.conf:

```
[sdowdle@csci351 ~]$ cat /etc/resolv.conf
# Generated by NetworkManager
search cs.montana.edu msu.montana.edu coe.montana.edu
nameserver 153.90.2.1
nameserver 153.90.2.15
```

How does DNS work anyway?



### DNS Related Commands

The **/usr/bin/host** command is part of the **bind-utils** package. Example:

```
host www.cs.montana.edu
host 153.90.127.197
```

The **/usr/bin/dig** command is part of the **bind-utils** package. Example:

```
dig MX cs.montana.edu (shows Mail eXchange record)
dig NS cs.montana.edu (shows NameServer record)
```

The **/usr/bin/nslookup** command is part of the **bind-utils** package. Example:

```
nslookup www.cs.montana.edu
```

nslookup interactively:

```
[dowdle@dowdle ~]$ nslookup
> server 8.8.8.8
Default server: 8.8.8.8
Address: 8.8.8.8#53
> www.montanalinux.org
```

```
Server: 8.8.8.8
Address: 8.8.8.8#53
```

```
Non-authoritative answer:
Name: www.montanalinux.org
Address: 69.60.124.50
> exit
```

```
[dowdle@dowdle ~]$
```

The **/usr/bin/whois** command is part of the **whois** package.

Unfortunately, much of the info is no longer shown these days and the usefulness of the command has diminished.

Example:

```
[dowdle@csci351 ~]$ whois montanalinux.org
whois montanalinux.org
[Querying whois.pir.org]
[whois.pir.org]
Domain Name: MONTANALINUX.ORG
Domain ID: D33213288-LROR
WHOIS Server:
Referral URL: http://www.networksolutions.com
Updated Date: 2012-08-03T21:30:52Z
Creation Date: 2000-08-18T21:48:24Z
Registry Expiry Date: 2017-08-18T21:48:24Z
Sponsoring Registrar: Network Solutions, LLC
Sponsoring Registrar IANA ID: 2
Domain Status: clientTransferProhibited https://www.icann.org/epp#clientTransferProhibited
Registrant ID: 5991102-NSI
Registrant Name: SCOTT DOWDLE
Registrant Organization:
Registrant Street: 704 Church Street
Registrant City: Belgrade
Registrant State/Province: MT
Registrant Postal Code: 59714
Registrant Country: US
Registrant Phone: +1.4063880827
Registrant Phone Ext:
Registrant Fax:
Registrant Fax Ext:
Registrant Email: dowdle@montanalinux.org
Admin ID: 5991102-NSI
Admin Name: SCOTT DOWDLE
Admin Organization:
Admin Street: 704 Church Street
Admin City: Belgrade
Admin State/Province: MT
Admin Postal Code: 59714
Admin Country: US
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Tech ID: 5991102-NSI
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Tech City: Belgrade
Tech State/Province: MT
Tech Postal Code: 59714
Tech Country: US
Tech Phone: +1.4063880827
Tech Phone Ext:
Tech Fax:
Tech Fax Ext:
Tech Email: dowdle@montanalinux.org
Name Server: NS33.WORLDDNIC.COM
Name Server: NS34.WORLDDNIC.COM
DNSSEC: unsigned
>>> Last update of WHOIS database: 2016-02-23T17:08:12Z <<<
```